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Putting SMEFT Fits to Work

The Standard Model Effective Field Theory (SMEFT) provides a consistent framework for comparing precision measurements at the LHC to the Standard Model (SM). The observation of statistically significant non-zero SMEFT coefficients would correspond to physics beyond the SM (BSM) of some sort. A more difficult question to answer is what, if any, detailed information about the nature of the underlying high scale model can be obtained from these measurements (the "Higgs Inverse Problem"). In this work, we consider the patterns of SMEFT coefficients in several example models and discuss the assumptions inherent in using global fits to make BSM conclusions. For the singlet scalar extension to the SM, we also consider the effects of loop level matching, and examine their importance alongside theoretical constraints on the model. As a by-product of our study, we present an up-dated global fit to SMEFT coefficients including some NLO corrections in the SMEFT theory.

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